THE HISTORY OF RECLAMATION LEGISLATION AND ITS IMPACT ON RECLAMATION PRACTICES IN COLUMBIANA COUNTY, OHIO

A Thesis

Presented in Partial Fulfillment of the Requirements
for the Degree of Bachelor of Science

by

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The Ohio State University
1985

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ACKNOWLEDGEMENTS

I would especially like to thank my adviser,Dr. Gary McKenzie, for his patience, guidance and encouragement. Special thanks also to Dave Buchanan of the Ohio Department of Natural Resources, Division of Reclamation for his time, advice and many helpful contacts. I would also like to thank Botanist,Mike Curran,for his help in identifying plants in the field. Finally, I would like to thank my wife,Vikki,for her support and help in typing this thesis.

ABSTRACT

This study traces the history of Ohio strip mine reclamation legislation and it's impact on six strip mine sites (active and inactive) in Columbiana County, Ohio. Observation of reclamation practices at the six study sites (mined between 1962 and present) show that the enactment of more stringent strip mine reclamation legislation over the last twenty-three years resulted in improved reclamation practices in Columbiana County, Ohio.

INTRODUCTION

Reclamation of strip mined lands in Ohio has markedly improved since Ohio enacted it's first strip mining legislation in 1948 (Board of Unreclaimed Strip Mined Lands, 1974). Improved land reclamation practices by strip mine operators is a direct result of more stringent Ohio strip mine reclamation legislation.

This study was undertaken because of my long term interest in coal mining and reclamation practices in Columbiana County, Ohio. Being a resident of Columbiana County for twenty-six years, I was directly aware of the impact of strip mining on the environment. This study involves six strip mining sites in Columbiana County, Ohio: one active and five inactive (Fig. 1). The six study sites were mined under four different strip mining laws; beginning with the initial Ohio strip mining legislation of 1948 and including the current 1981 D-permit legislation, Chapter 1514 of the Ohio Revised Code. This report will identify and compare reclamation practices of these study sites in Columbiana County to show many inadequacies of past Ohio reclamation legislation and also, the impact of recent legislation on reclamation of strip mined lands.

OHIO

Figure 1. Location of Columbiana County.

CHARACTERISTICS OF THE STUDY AREA

Location and Identification

The six study sites are located in the Ohio River Basin of Columbiana County, Ohio (Map 1) and (Fig. 2). All six sites drain into Little Beaver Creek directly or indirectly. Study sites consist of strip mined lands and were chosen because of 1) differing mining periods, 2) differing reclamation practices and projects, and 3) their close proximity to each other. The sites are categorized by company mining or mined and strip mining permit or license mined under (Fig. 3).

Geology

The bedrock underlying the surface of Columbiana County consists of strata of Pennsylvanian Age. The Pennsylvanian System is composed of three major formations: The Pottsville Formation, the Allegheny Formation, and the Conemaugh Formation (Fig. 4). The dominant formation in Columbiana County is the Allegheny Formation. The Conemaugh Formation is found in areas of high relief in southern Columbiana County and the Pottsville Formation has limited exposure in deep stream valleys of northern Columbiana County. These three Pennsylvanian formations are composed of sedimentary strata deposited in a deltaic environment between 325 and 280 million years ago (Davis, 1983). The Pottsville, Allegheny and Conemaugh Formations consists of sandstones, siltstones, shales, limestones, coals and clays (Fig. 5).

The strata are relatively flat-lying and have a regional dip approximately 20 feet per mile to the southeast. Locally, this gentle regional dip is interrupted by undulatory folds (Stout and Lamborn, 1924).

Map 1.(modified from Division of Geological Survey,1971). Study Sites.

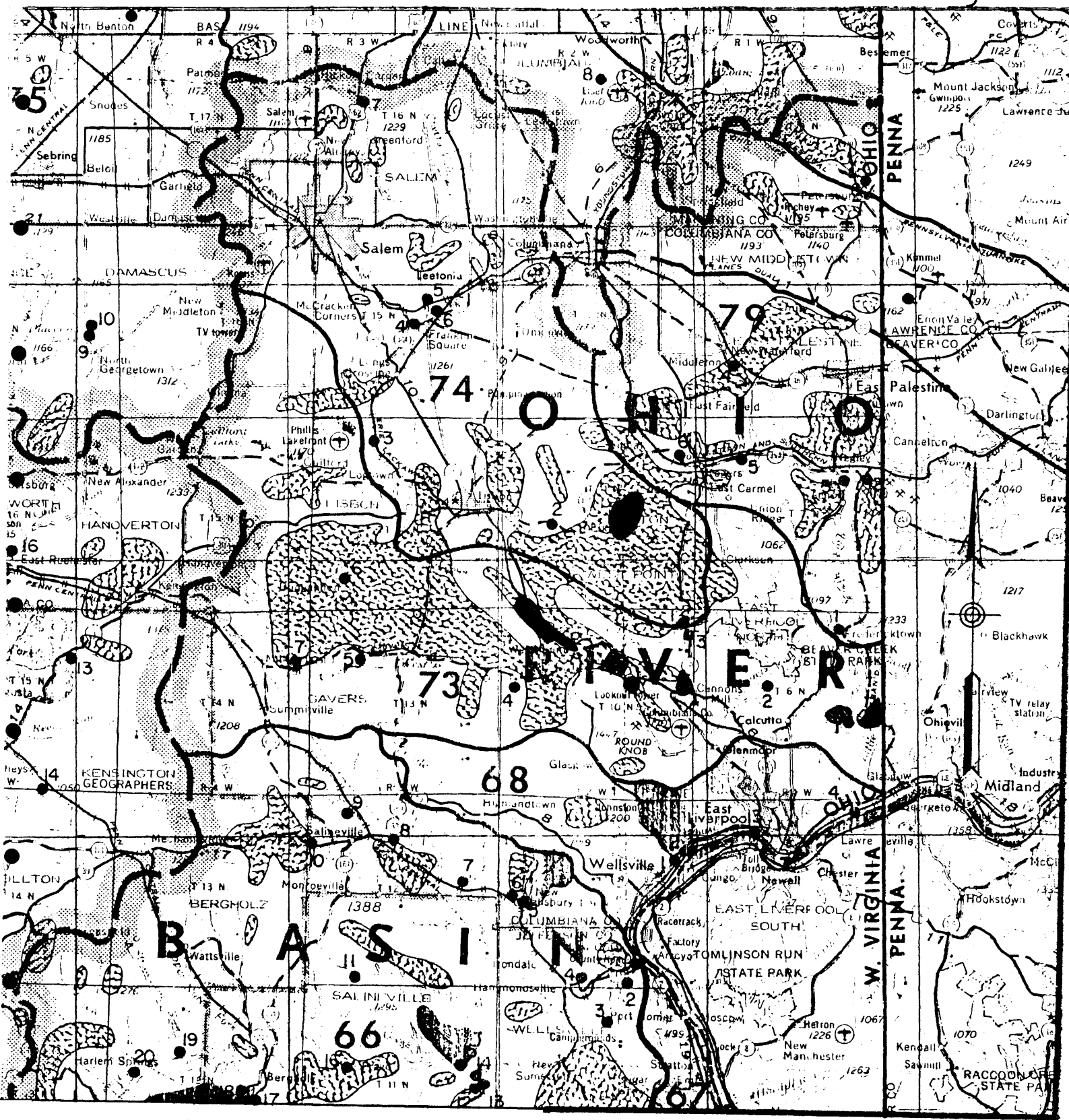


Figure 2.(Modified from Ohio Department of Natural Resources, 1973).

Study Sites - unreclaimed
reclaimed

Scale; 1 : 250,000

STUDY SITES

Mining Company	License or Permit No.	Date Mined	Location
Island Run Coal Company	4335,4576, 4773	11-62 to 11-65	Columbiana Co., St. Clair Twp. Sec. 24,13
Kelly Mining Co.	A-663	10-69 to 10-70	Columbiana Co., St. Clair Twp. Sec 23
Buckeye Coal Mining Co.	C-1061,	4-79 to 4-82	Columbiana Co., Madison Twp. Sec. 10, 15
	C-1501	9-81 to 9-84	Columbiana Co., Madison Twp. Sec. 14, 15
C & W Mining Co.	C-1109	6-81 to 6-84	Columbiana Co., Madison Twp. Sec. 13
	C-1453	6-81 to 6-84	Columbiana Co., Elk Run Twp. Sec 31, 6
Ferris Coal Co.	D-40	6-82 to ----	Columbiana Co., Elk Run Twp. Sec. 14, 15, 22, 23

Figure 3.

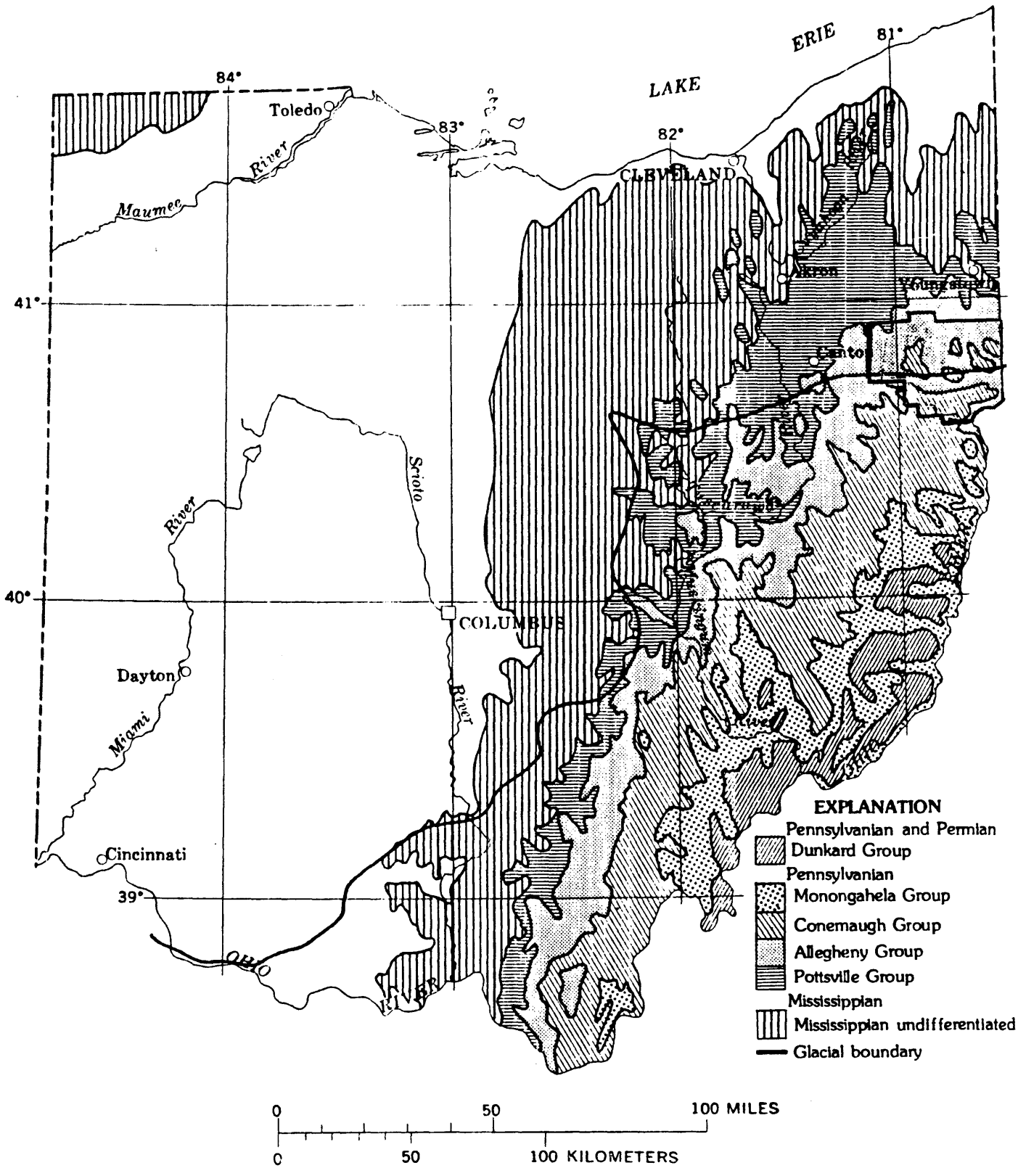


Figure 4. (From Collins and others, 1979).

Section of the Pottsville and Allegheny Formations in Columbiana County

System	Formation	Member	General Description	Thickness Ft.	Thickness In.
PENNSYLVANIAN	ALLEGHENY	Upper Freeport or No. 7	Coal	2	8
			Shale	..	2
			Coal	..	5
			Clay, plastic, siliceous	6	7
		Upper Freeport	Limestone, fresh water, unsteady	3	8
			Coal, seldom present	..	3
		Bolivar	Clay, flint and plastic, unsteady	6	0
		Upper Freeport	Sandstone, locally present	15	0
			Shale, siliceous	23	0
		Lower Freeport or No. 6a	Coal	..	8
			Shale	..	1
			Coal	..	9
			Clay, plastic, siliceous	4	5
		Lower Freeport	Limestone, fresh water, unsteady	1	7
			Clay, flint and plastic, variable	5	7
			Shale, siliceous	8	0
		Lower Freeport	Sandstone, locally developed	25	0
			Shale, siliceous	6	0
		Upper Kittanning	Coal, very unsteady	..	8
			Clay, impure	1	5
			Shale with ore nodules	10	0
		Washingtonville	Shale, bony, very fossiliferous	2	2
			Shale, dark	4	6
		Middle Kittanning or No. 6	Coal, good	1	7
			Coal, bony	..	1
			Clay, siliceous, often with concretions	4	10
		Salem	Limestone, impure, fresh water	..	8
		Oak Hill	Clay, part flint, impure	6	5
			Shale, siliceous	17	2
		Hamden	Shale and limestone, very fossiliferous	1	10
		Lower Kittanning or No. 5	Coal, steady, but variable in thickness	2	1
			Clay, plastic, good	8	0
			Shale, siliceous	15	0
		Lower Kittanning	Sandstone, variable in composition	20	0
			Shale, very siliceous	29	0
		Vanport	Shale, black, very fossiliferous	1	1
			Shale, gray, in places fossiliferous	5	8
			Limestone, dark, impure, fossiliferous	..	8
			Shale, gray, in places fossiliferous	8	11
		Clarion or No. 4a	Coal, impure	..	8
			Clay, siliceous, good	7	3
			Shale, siliceous	8	0
		Brookville or No. 4	Coal, shaly, local	1	0
	POTTSVILLE		Clay, siliceous	2	3
			Shale, siliceous	8	0
		Tionesta or No. 3b	Coal or coaly shale, unsteady	..	6
			Clay, siliceous	1	0
			Shale and shaly sandstone	14	0
			Limestone, blue, fossiliferous	..	7
			Shale, calcareous, fossiliferous	..	4
			Clay shale	3	0
			Shale, siliceous	12	0
			Sandstone, massive	8	0
			Total	318	2

General Section of the Conemaugh formation in Columbiana County

Member	General description	Thickness Ft.	Thickness In.
Connellsville	Sandstone, massive, coarse-grained	40	0
	Shale, pink to gray (Clarksburg coal absent)	27	0
Clarksburg	Shale, pink, with nodular limestone	3	0
	Shale, mostly pink	20	0
Morgantown	Sandstone, massive, coarse-grained	20	0
	Shale, mostly pink	30	0
	(Elk Lick coal, Elk Lick limestone, Birmingham shale, Skelley limestone, and Duquesne coal absent.)		
Ames	Limestone, fossiliferous, locally ferruginous	1	4
	Shale, gray to red	12	0
Harlem	Coal, not persistent	..	10
	Clay, siliceous	1	0
Round Knob	Shale, plastic, pink to red and mottled	32	0
	Shale, siliceous, with thin shaly sandstone	54	0
	(Saltzburg sandstone, Barton coal, Ewing limestone, Cow Run sandstone, and Portersville limestone absent.)		
Anderson	Coal, shaly	1	0
	Clay, siliceous, impure	2	0
	Shale, gray, siliceous	12	0
Cambridge	Limestone, fossiliferous, gray to brown, usually ferruginous	1	2
	Shale, gray to dark	4	10
Wilgus	Coal, locally present	..	10
	Clay, gray, siliceous	1	0
	Shale, gray, siliceous, with thin sandstone layers near top (Buffalo sandstone absent)	62	4
Brush Creek	Shale, dark, fossiliferous, locally with dark, nodular, fossiliferous limestone in the lower or middle portions	12	0
	Shale, dark, carbonaceous	1	3
Brush Creek	Coal, shaly, locally present	..	7
	Clay, gray, siliceous	2	6
	Shale and sandstone	19	8
Mason	Coal, shaly, usually absent	..	1
	Clay, plastic, gray, olive or pink, locally with nodular limestone near base and with irregular masses of flint clay near middle	5	5
Upper Mahoning	Sandstone, soft, micaceous, locally present	15	0
	Shale, gray, siliceous	9	0
	Shale, dark, carbonaceous, in places containing fresh water fossils	..	8
Mahoning	Coal, variable in thickness	1	10
Mahoning or Thornton	Clay, plastic, gray	5	0
Mahoning	Limestone, nodular, with fresh-water fossils	1	0
	Shale, argillaceous to siliceous, gray	10	0
Lower Mahoning	Sandstone, locally present, lower part often conglomeratic	22	0
	Shale, gray, siliceous	4	0
	Shale, dark, locally with fresh-water fossils	1	0
		437	4

Figure 5. (From Stout and Lamborn, 1924).

Important coal beds in Columbiana County are, in descending order: The Upper Freeport (No. 7), the Middle Kittaning (No. 6), the Lower Kittaning (No. 5) and the Brookeville (No. 4) coals. Coal beds mined in study sites are the Upper Freeport (No. 7) and Middle Kittaning (No. 6) coals. See (Figure 6) for general distribution of Upper Freeport (No. 7) and Lower Kittaning (No.5) coals.

Physiography

The study area, Columbiana County, is defined by two physiographic regions (Fig. 7). The northern half of Columbiana County is covered by glacial ground moraine, end moraines and outwash deposits of the Wisconsinan ice sheet (Stout and Lamborn, 1924). The southern half of Columbiana County consists of the unglaciated Allegheny Plateau. The glaciated portion of the Allegheny Plateau is characterized by gentle rolling hills and broad, U-shaped valleys. Smooth rolling hills comprise the surface topography of the unglaciated portion of Columbiana County, with the majority of slopes steeper below than above, and with moderately sloping land between the valleys (Fenneman, 1938). The surface of Columbiana County in the glaciated area ranges from 1,200 to 1,300 feet in altitude, while the unglaciated region ranges from an altitude of 1,447 feet in Madison Township to a low altitude of 652 feet in Yellow Creek Township (Stout and Lamborn, 1924).

Soils

Soils in Columbiana County have a pH range from 4.5 to 6.5 and all are susceptible to erosion when vegetation is removed (United States Department of the Interior, 1981). The soils in the study area range from low to moderately high in productivity. See General Soil Map of Columbiana County (Map 2) for more detailed description of soils. Vegetation in Columbiana County consists of forest cover,

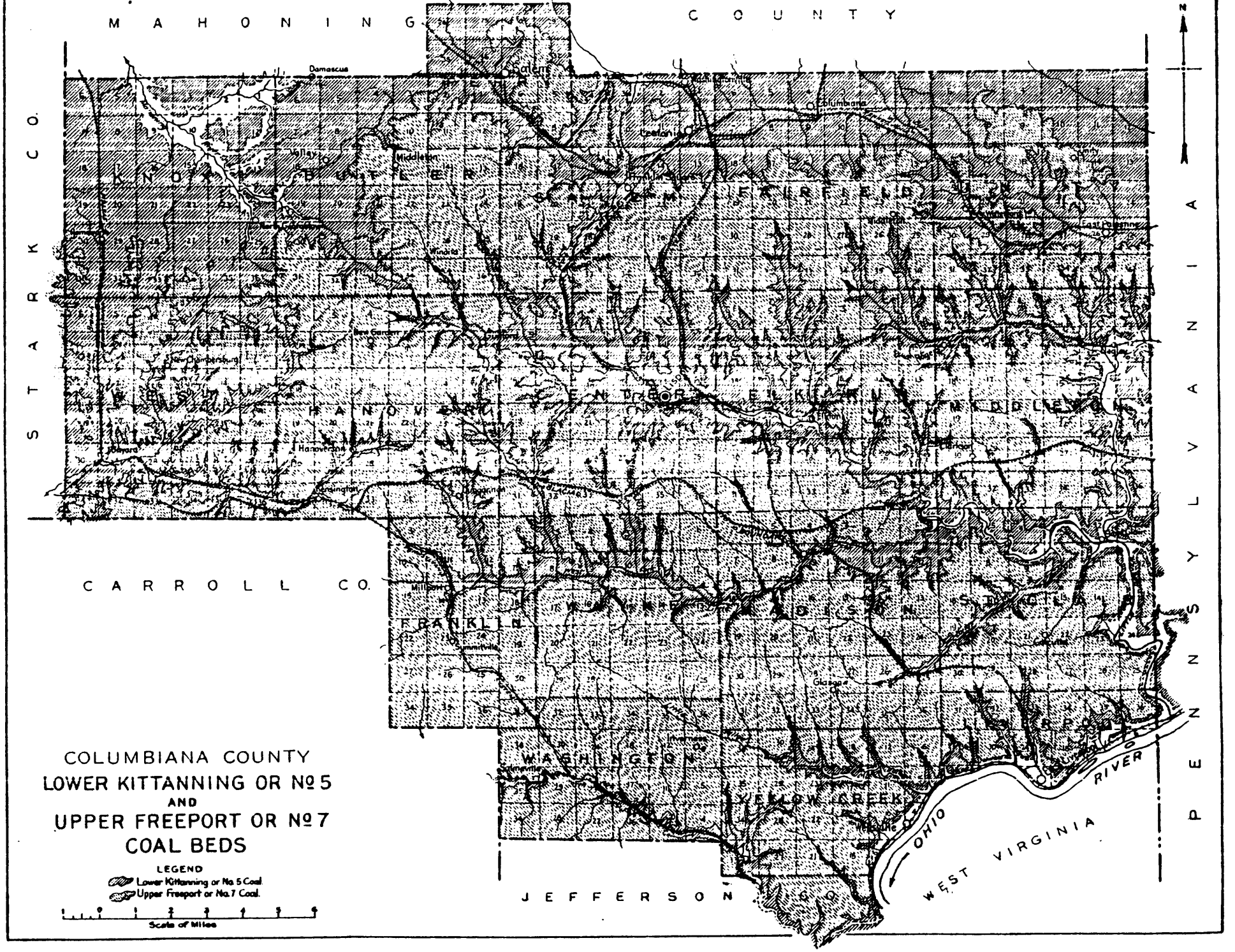


Figure 6. (From Stout and Lamborn, 1924).

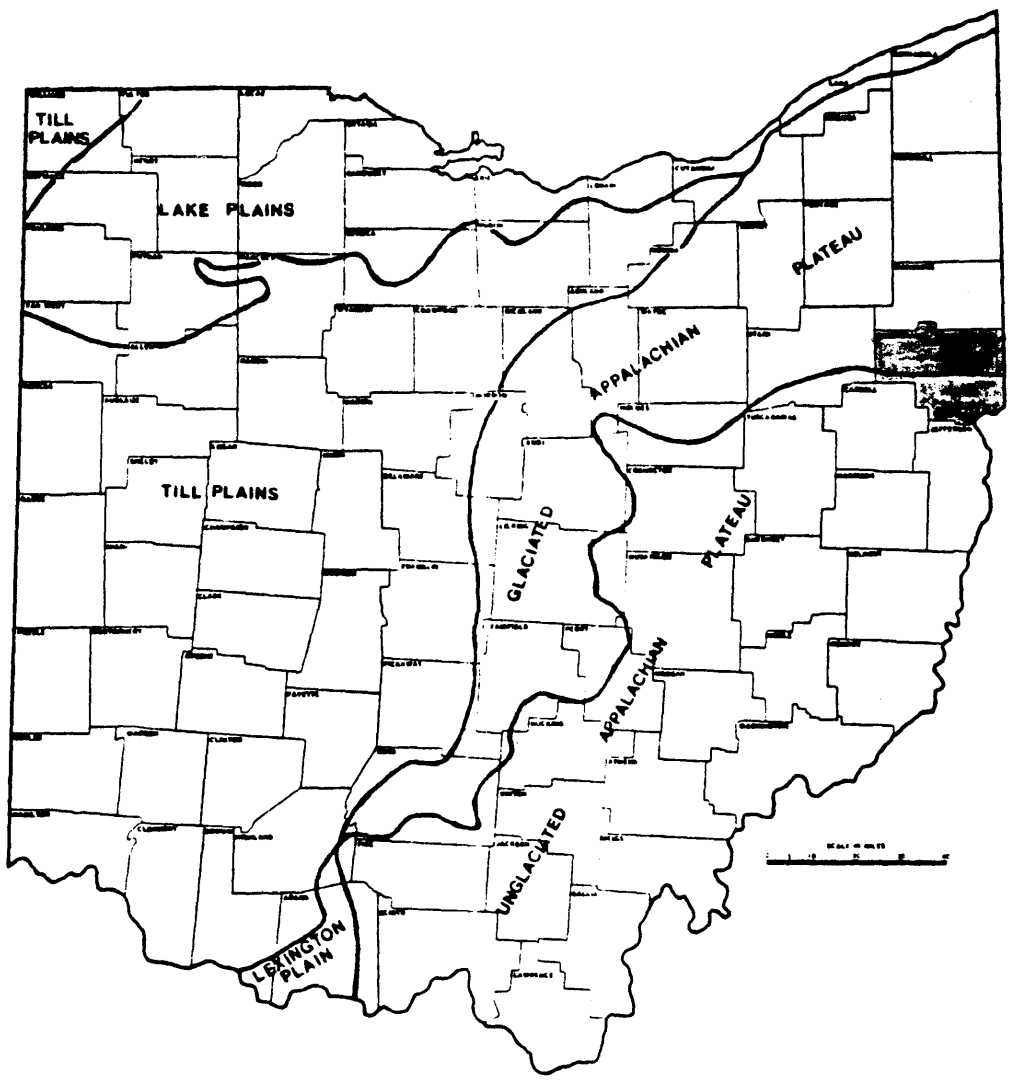


Figure 7. Physiographic Provinces in Ohio (From the Ohio Department of Natural Resources).

Map 2 General Soil Map of Columbiana County (ODNR, Division of Land and Soil, 1963).

generally on all but the low relief agricultural land (U.S.D.I., 1981).

Climate

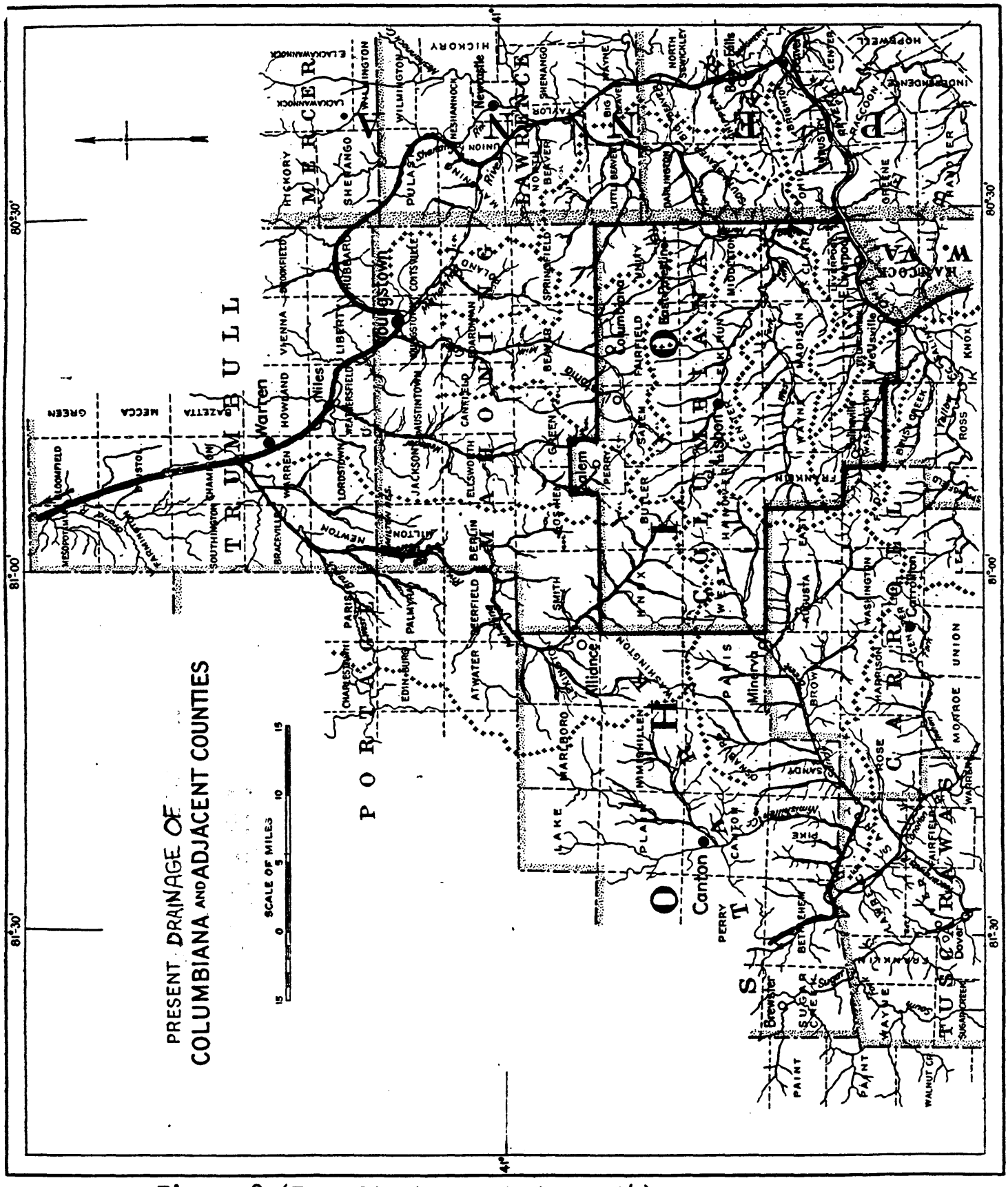
The study area is characterized by a temperate continental climate having a mean annual temperature of 50 degrees Farenheit and a mean annual rainfall of 38 inches (U.S.D.I., 1981).

Drainage

Little Beaver Creek is the most important stream in Columbiana County and the Ohio River Basin. It consists of three main streams; North Fork, Middle Fork and West Fork (Fig. 8). Little Beaver Creek empties into the Ohio River near Smiths Ferry, Pennsylvania (Stout and Lamborn, 1924).

Mining

Coal is the most important mineral resource in Columbiana County. Coal production in 1980 in Columbiana County amounted to 1, 028,032 short tons with 26 active mines reporting (Ohio Department of Industrial Relations, 1980). 98.6% of the coal was produced by strip mining. The remaining 1.4% was mined by the continuous underground technique and augering (Fig. 9). As of July 1985, according to information in the files of the Ohio Department of Natural Resources, Division of Reclamation, there are 51 active strip mines in Columbiana County permitted to mine 3,771.5 acres.


PRESENT DRAINAGE OF
COLUMBIANA AND ADJACENT COUNTIES
SCALE OF MILES
0 5 10 15
15
TRUMBULL
MERCER
MAHONING
PORTAGE
COLUMBIANA
CARROLL
STARK
TUSCARAWAS
Warren
Niles
Youngstown
Newcastle
Salem
Alliance
Canton
Massillon
Wooster
New Philadelphia
Dover
Brewster
Ravenna
Hopewell
Independence
Lake Milton
Lake Placid
Sugar Creek
Paint Creek
Walnut Creek
Mahoning River
Shenango River
Beaver River
Little Beaver
Big Beaver
Yellow Creek
Sandy
Nimishillen
Tuscarawas River
Conotton Creek
Stillwater
Middle Fork
Indian Fork
Sandy Fork
Pike
Fairfield
Bethlehem
Jamestown
Hubbard
Girard
Lordstown
Warren
Howland
Vienna
Brookfield
Hickory
Sharon
Sharpsville
Wilmington
Jackson
Austintown
Cortland
Canfield
Berlin
Milton
Newton
Deerfield
Palmyra
Charlestown
Edinburg
Atwater
Ellsworth
Green
Beloit
Goshen
Smith
Perry
Lisbon
Columbiana
Fairfield
Butler
Knox
Center
Hanover
Madison
Franklin
Wayne
Monroe
Union
Washington
Harrison
Brown
Rose
Carrollton
Augusta
East
West
Paris
Minerva
Marlboro
Lexington
Plain
Canton
Perry
Jackson
Bethlehem
Fairfield
Lawrence
Sandy
Pike

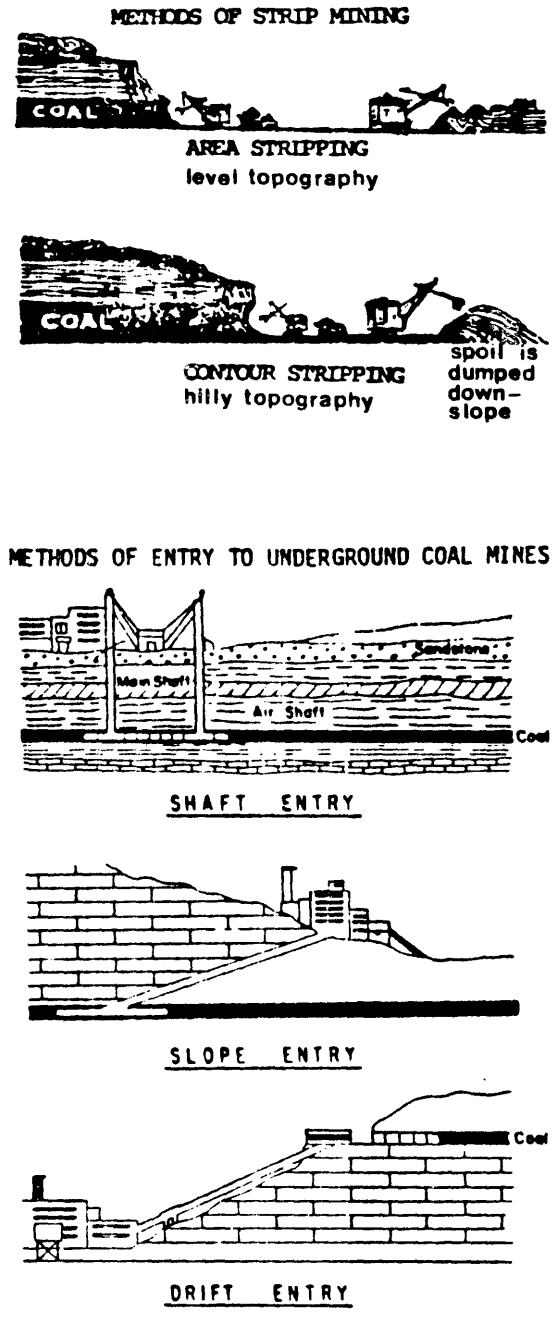


Figure 9. The basic types of surface and underground coal mining (From the Ohio Environmental Protection Agency, 1979).

HISTORY OF STRIP MINING AND RECLAMATION LEGISLATION

Strip mining began in the state of Ohio in the early 1800's. Strip mining consisted of removing the coal outcrop by picks and shovels or using horse drawn wooden scrappers to remove thin rock and soil layers covering shallowly buried coal seams (Board on Unreclaimed Strip Mined Lands, 1974). Increased demand for coal and the appearance of the steam shovel in 1914 permitted strip mining to evolve into the industry we know now. The most important technological advances in strip mining equipment and methods occured in the late 1930's, enabling strip mining to become more efficient and economical than deep mining in most areas of Ohio.

The state of Ohio had no regulations requiring strip mine operators to reclaim mined lands until 1948. For this reason, most all land mined before this initial legislation was left in a totally unreclaimable state and severe environmental degradation resulted (Board Unreclaimed Strip Mined Lands, 1974).

The first legislation, Chapter 1513, House Bill No. 314 of the Ohio General Code, came before the General Assembly of Ohio in June 1947. House Bill 314 required strip mine operators to post a reclamation bond of $100.00 per acre before they could obtain a permit to mine. Reclamation, according to House Bill No. 314 required the operator to "level off peaks and ridges of spoil banks to a minimum width of 15 feet." The amended House Bill No. 150 to Chapter 1513 of the Ohio General Code 1949 required operators to reduce peaks and depressions and to return the surface to a "gently rolling topography." Also, the width of the graded spoil banks was altered to a width of no less than 20 feet. The law also required the planting of trees, shrubs, legumes or grasses where "revegetation is possible." The 1948 law

was further amended to in 1955, 1959, 1961, and 1965. Under this legislation, many operators found it more profitable to abandon mined lands and forfeit their bonds than to perform the required reclamation (Board of Unreclaimed Strip Mined Lands, 1974). When operators did comply with reclamation requirements, they proved to be inadequate and the strip mine often remained in an undesireable condition.

The 1972 Ohio Strip Mine Law established the first strict reclamation requirements. Performance bond was increased to reflect the actual costs of reclamation (Board of Unreclaimed Strip Mined Lands, 1974). The most important deterrent preventing strip mine operators from abandoning strip mines without reclaiming the affected lands was adopted under the 1972 Strip Mine Law. The forfeiture of bond by an operator could result in the state's refusal to issue the violating operator any future mining permits. The non-issuance of future mining permits to strip mine operators forfeiting reclamation bonds was a major step by the state in making operators adhere to adequate land reclamation requirements. Also in 1972, the Ohio General Assembly created the Board on Unreclaimed Strip Mined Lands which was responsible for the identification and restoration of abandoned mined lands and to project possible future uses and value of eroded lands within the state (Board of Unreclaimed Strip Mined Lands, 1974).

Public Law 95 - 87 or the Surface Mining Control and Reclamation Act of 1977 was in direct response to the adverse impact of erosion and sedimentation created by coal mining on water resources. Public Law 95 - 87 requires 1) the operator to make an analysis of the potential effects of the proposed mine on area hydrology, 2) the hydro-

logy of the mining area be monitored prior and during mining and 3) that mining operators take necessary steps to control the hydrologic balance and reclamation of the land. Also, under this 1977 legislation, an Abandoned Mine and Reclamation Fund was created for the purpose of restoration of land and water resources adversely affected by coal mining. At the same time, Ohio passed a law governing the reclamation of lands mined prior to the 1972 Strip Mine Law.

The present strip mining legislation in effect is Chapter 1514 of the Ohio Revised Code enacted in 1981. It is the most stringent of all strip mining legislation enacted to this date. Under Chapter 1514, for an operator to receive a mining permit, he must first comply with a complete plan and timetable for mining, reclamation and future use of the affected area. Under this 1981 legislation, suitable reclamation of lands affected by strip mining is now a reality.

STUDY SITES

Method of Study

On site data of the study sites in Columbiana County was collected between June 13, 1985 and June 22, 1985. Data was collected from fieldwork which consisted of on site observation of environmental conditions and interviews with residents in the vicinity of the six strip mine sites. Strip mine permit and license data was collected from files of the Division of Reclamation, Columbiana County, Salem office and the Columbus Fountain Square Office.

Island Run (4335, 4576, 4773)

Island Run was mined under License Numbers 4335, 4576 and 4773 by the Island Run Coal Company. The mining site is located in the northwest corner of Section 24 and extending north into the south central portion of Section 13 in St. Clair Township, Columbiana County, Ohio (Fig. 10). Coal was mined from this area by the Island Run Coal Company from November 1962 to November 1965 under the provisions of the 1961 fourth amended version of the original 1948 strip mine legislation, Section 1513.16 of the Revised Code of Ohio. Coal was removed from the Island Run site by contour strip mining. The coal bed mined was not needed to license the operation but was most likely only the Upper Freeport (No. 7) coal. Land affected by coal mining in the Island Run site was 97.4 acres.

Reclamation under Section 1513.16 of the Ohio Revised Code required the tops of spoil banks to be graded to not less than 20 feet in width and revegetated where possible. In 1964, 10.7 acres of graded spoil was approved by an inspector from the Ohio Division of Reclamation. Other than these few acres of spoil bank grading, no

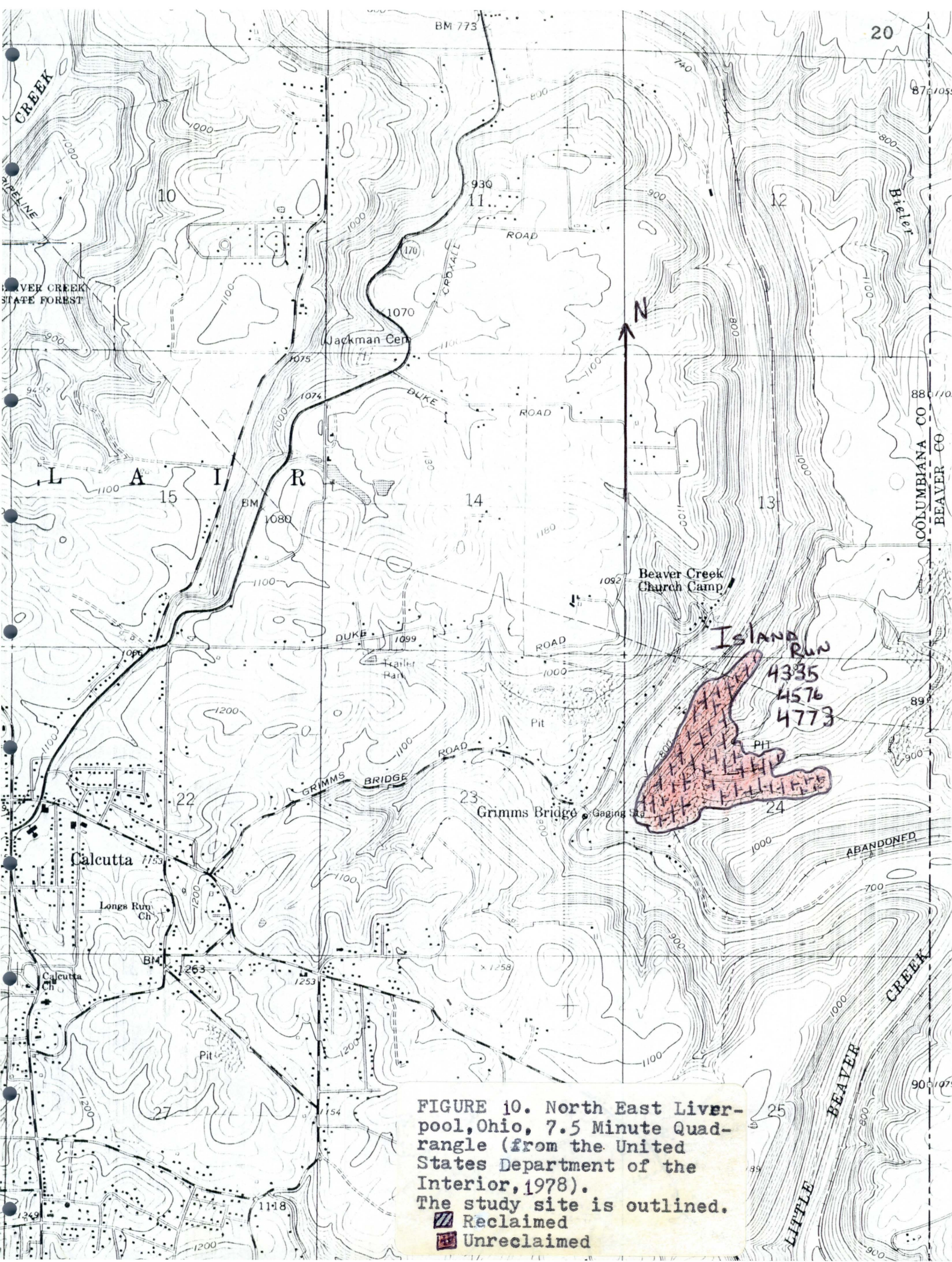


FIGURE 10. North East Liverpool, Ohio, 7.5 Minute Quadrangle (from the United States Department of the Interior, 1978).
The study site is outlined.
Reclaimed
Unreclaimed

other reclamation was performed by the Island Run Coal Company. The operators of the Island Run Coal Company followed the frequent path of the times by forfeiting their performance bond. The performance bond of $8,582.67 was received in 1972 by the Division of Forestry and Reclamation. After receiving the forfeited bond, the Division of Forestry and Reclamation publicly advertised for two years for a contractor to reclaim the Island Run site. By 1974, only one acceptable bid had been received and that contractor was unable to take the reclamation project because of the insurance company's reluctance to write any bonds for reclamation of land projects. The insurance company cited "strict reclamation inspections" in part "due to environmentalists" have made it difficult to insure reclamation projects (Division of Reclamation Files, Ohio Department of Natural Resources).

Island Run's present condition, other than natural vegetational cover is unreclaimed since abandonment by the Island Run Coal Company. The only changes are that caused by erosion; talus fallen from high walls and the headward erosion of rills and gulleys in spoil banks. Plate 1 is a 1975 aerial photo of the Island Run site. From this photo the devestation of land by coal mining is quite apparent. The lack of vegetation, steep grades and many impoundments of water make the land unusable for even grazing by cattle.

Figures 11 through 19 examplify present conditions of the Island Run site. Figure 11 shows highwall of final cut. Figure 12 depicts dangerous overhang on highwall exposure and Figure 13 shows tallus at the foot of same highwall. Figure 14 depicts a pond formed in final cut between highwall and spoil bank. Figure 15 shows an ungraded peak of spoil material with sparse vegetation. Figure 16 is a photo of a

Plate 1. Island Run site
(ODNR, Remote Sensing, 1975)
1"=400'
Arrows designate study site.

Figure 11. Highwall on southern face of Island Run site.

Figure 12. Dangerous overhang on northern highwall.

Figure 13..Talus at foot of highwall in Figure 12.

Figure 14. Impoundment of water between highwall and spoil bank.

Figure 15. Ungraded spoil peak.

Figure 16. Graded spoil bank.

graded spoil bank. Figure 17 depicts a deep erosional rill in a graded spoil bank. Figure 18 is an example of sandstone tallus on the slope of a spoil bank and Figure 19 is a picture of sulfates contaminating a small tributary of Little Beaver Creek.

Figure 17. Erosional rill in graded spoil bank.

Figure 18. Talus on slope of spoil bank.

Figure 19. Sulfates contaminating tributary to Little Beaver Creek.

These photos also depict the present vegetational cover on the Island Run site. The site is now 50% vegetated; 25% are various trees and the other 25% consists of grasses and other vegetation. See Table 1 for vegetational distribution. As of July 1985 there are no plans by the state of Ohio to reclaim the land adversely affected by strip mining on the Island Run site.

Table 1. Vegetation Distribution of Island Run site.

Vegetation Distribution

Wooded 25%, Grasses and associated plants 25% and Unvegetated land 50%.

TREES	%
Locus	40
Sumac	25
Elm	7
Aspen	4
Cherry	12
Maple	3
Willow	2
Red Maple	1
Sycamore	.5
Cucumber Magnolia	.5
White Pine	1
Others	4
Total	100%

OTHER VEGETATION	%
Tall Fescue	25
Raspberry	35
Grapevine	15
Sasafras	6
Poison Ivy	3
Poison Oak	3
Others	13
	100%

Kelly (A-663)

The Kelly Mining Company mined coal by the strip mining method in Columbiana County under the license A-663. The Kelly site is located in the northeast quarter of Section 23, St. Clair Township, Columbiana County, Ohio (Fig. 20a). Coal was mined from October 1969 to October 1970. Area affected by mining was 9.5 acres (Ohio Department of Natural Resources, Division of Reclamation Files).

The Kelly site was mined under the 1965 amended Chapter 1513 of the Ohio Revised Code. Under Section 1513.16 of the Ohio Revised Code, the operator had two years after filing a "land affected by the operation" report to reclaim such land. Reclamation requirements were similar to the original 1948 Chapter 1513 legislation in that grading was to be done to produce a more uniform topography and planting upon spoil banks and final cuts to reduce erosion. The 1965 Chapter 1513 of the Ohio Revised Code raised the reclamation performance bond to $225.00 per acre and the grading of the tops of spoil banks "to an approximate level surface having the width of not less than thirty feet."

The Kelly Mining Company under this 1965 Strip mining legislation, failed to reclaim the affected 9.5 acres and forfeited their performance bond (Plate 2). In response, the Division of Reclamation issued the failure to reclaim order for A-663 in December 1980. The Kelly site was reclaimed by June, 1985 (Figures 20b & 21) by the Division of Reclamation. Figures 20 & 21 show reclamation was recently completed because of large dozer still on site. Reclamation included removal of ponds in final cut and filling of depressions by grading of spoil. See Plate 2 and Figures 20 & 21 for contrasting views of before and after reclamation. Vegetation on reclaimed

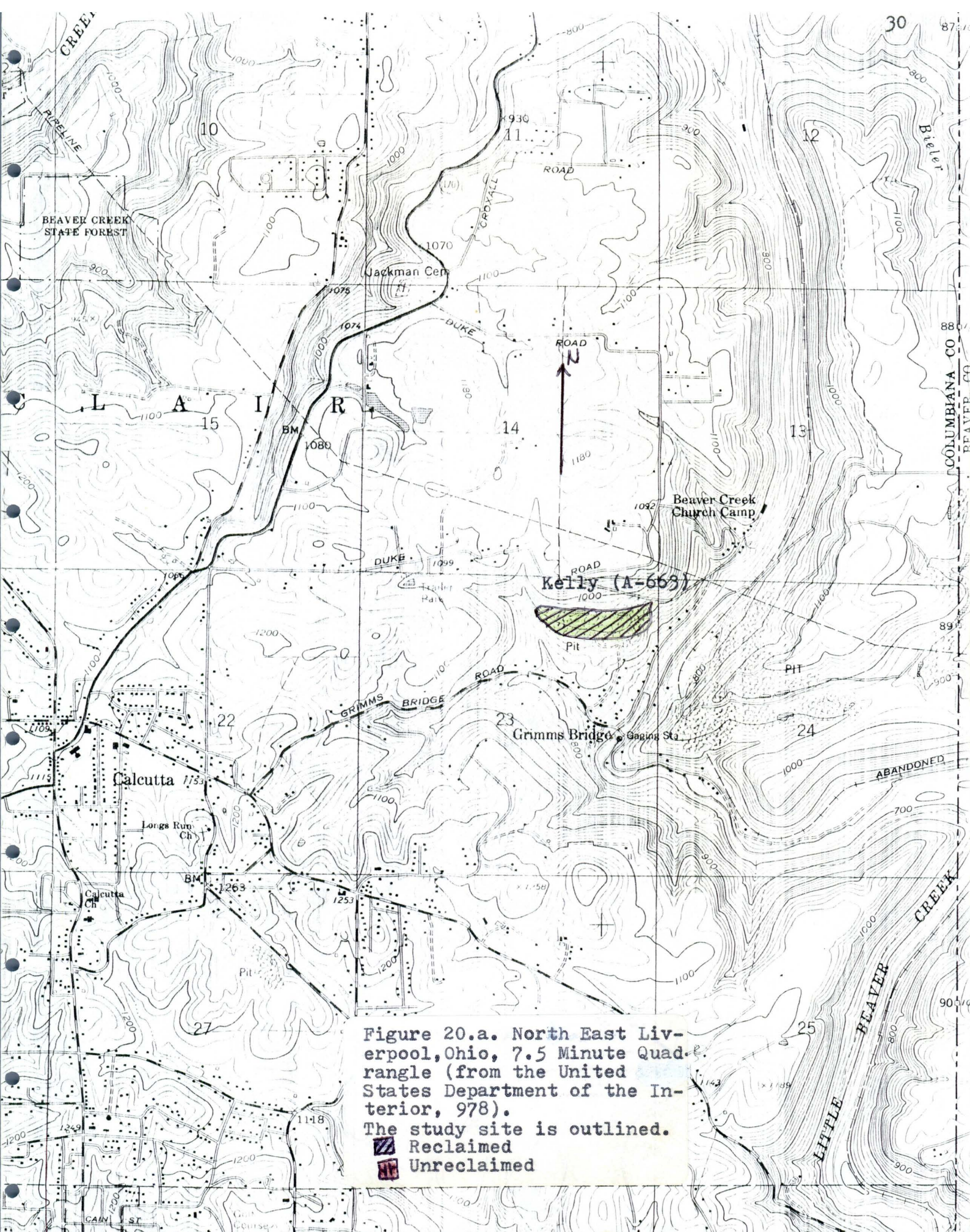


Figure 20.a. North East Liverpool, Ohio, 7.5 Minute Quadrangle (from the United States Department of the Interior, 978).
The study site is outlined.
Reclaimed
Unreclaimed

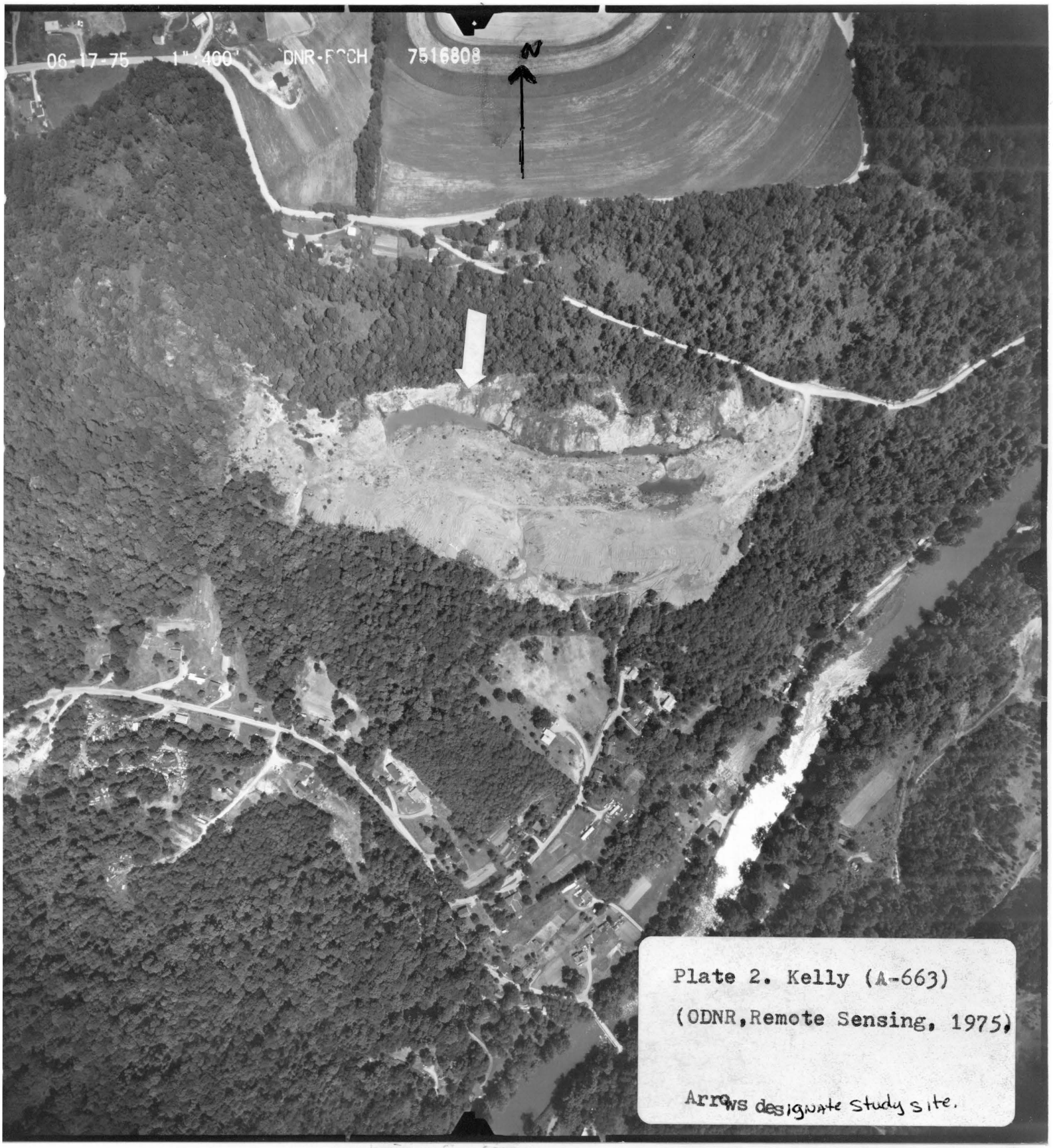


Plate 2. Kelly (A-663)
(ODNR, Remote Sensing, 1975)

Arrows designate study site.

Figure 20b. Kelly A-663 site reclaimed. Viewed from south.

Figure 21. Kelly A-663 site reclaimed. View from south.

Kelly site consists of fescue, rye grass and grain grasses, such as barley and oats. Even though this is an area of bond forfeiture, the land has been reclaimed under the current Chapter 1514 of the Ohio Revised Code.

Buckeye (C-1061 and C-1501)

C-1061 and C-1501 were both mined by the Buckeye Coal Company. Permit C-1061, mined from April 1979 to April 1982, is located in the south central quarter of Section 10 and north central quarter of Section 15, Madison Township, Columbiana County, Ohio (Fig. 22). Permit C-1501, mined from September 1981 to September 1984, is located in the east central third of Section 15, Madison Township, Columbiana County, Ohio (Fig. 22). Because of the close proximity of C-1061 and C-1501, and the fact that both sites were mined and recently reclaimed by the Buckeye Coal Company under the 1975 Chapter 1513, Strip Mining and Reclamation of Mined Land, of the Ohio Revised Code; they will be considered together.

The 1975 legislation is basically the same as the 1972 Strip Mine law which was the most stringent strip mine legislation enacted by the State of Ohio. Under the 1972 and 1975 Chapter 1513 of the Ohio Revised Code, reclamation requirements were detailed removing the prior ineffective interpretation of generalized reclamation requirements to the discretion of mining operators. Chapter 1513 of the Ohio Revised Code required "a complete plan for mining and reclaiming the area of land to be affected, which shall include a statement of the intended future use of the area" to be submitted with the application for permit. Also under the provision of Chapter 1513, a mining operator must begin reclaiming within three months of removal of overburden. Surety bond under this legislation varied

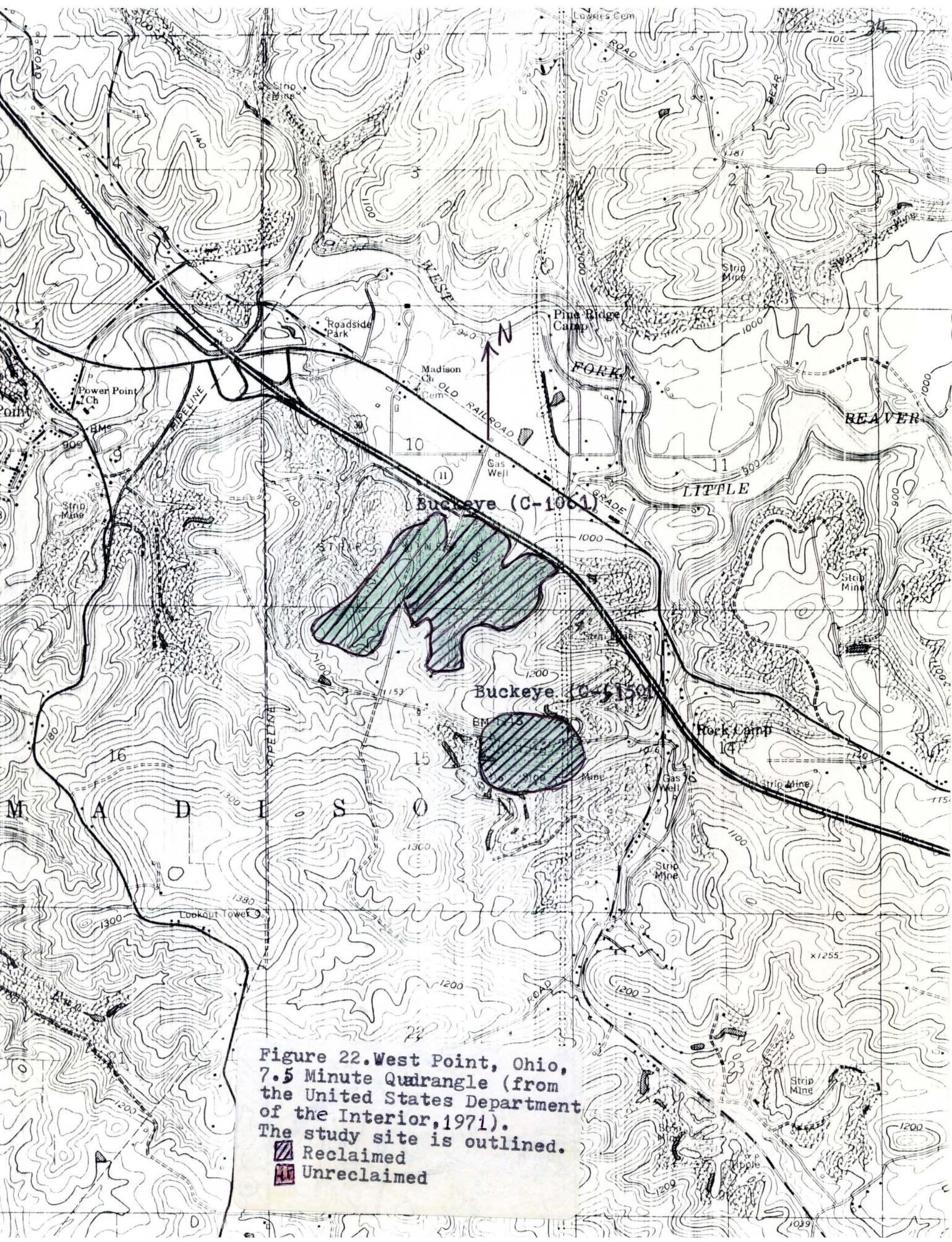


Figure 22. West Point, Ohio, 7.5 Minute Quadrangle (from the United States Department of the Interior, 1971). The study site is outlined.
Reclaimed
Unreclaimed

Surety bond under this legislation varied in amount and was based on value of land prior to mining and projected actual cost of reclamation to return affected land to a productive area. Public Law 95-87 of 1977 also affected these mining operations by requiring operators to set up test areas to monitor the hydrology of the site and vicinity. These test areas were monitored by the Ohio E.P.A. and other private agencies. Water was monitored prior to mining, during mining and after mining to detect any adverse effects on the hydrology of the area; including contamination by sulfates and sedimentation. Permits issued under the 1972 legislation were classified as B-Permits and permits issued under the 1975 provisions of Chapter 1513 were classified as C-Permits.

Buckeye sites C-1061 and C-1501 are both nearing completion of reclamation. C-1061 affected 55 acres. Performance bond for both sites ranged from $3500.00 to $3600.00 an acre. Both sites will be eligible for release of performance bond upon approval by the Division of Reclamation in 1986. Land on both sites prior to mining was designated as rangeland of which some were previously affected by mining. Both sites mined coal from the Middle Kittaning (No. 6).

Plate 3 shows Buckeye C-1061 site after mining and before reclamation. Plate 4 shows the Buckeye C-1501 actively mining before reclamation. In the western portion of Plate 4 there is evidence of previous abandoned mined lands; highwalls with water impounded in final cut and sparse vegetation on spoil banks. Figures 23 and 24 represent the progress of year one and two reclamation on C-1061. Figures 27 and 28 show progress of reclamation practices on site C-1501. Vegetation on both sites consist of fescue, rye grass, birdsfoot trefoil and yellow sweet clover. Inspection of April 3, 1985

Plate 3. Buckeye (C-1061) (ODNR, Remote Sensing, 1982).

Arrows designate study site.

Plate 4. Buckeye (C-1501)

(ODNR, Remote Sensing, 1982).

Arrows designate study site and abandoned previously mined area.

Figure 23. Reclaimed area in western portion of C-1061.

Figure 24. Reclaimed area west C-1061 with abandoned mine highwall in background.

Figure 25. Recently reclaimed area, east C-1061.

Figure 26. Recently reclaimed area, east C-1061. Erosion, ruts and minor wet spots evident.

Figure 27. Recently reclaimed area, north C-1501. Area in foreground recently seeded and mulched.

Figure 28. Recently reclaimed area C-1501 south. Minor erosion and drainage ditch visible.

of Buckeye C-1061 and C-1501 by an inspector of the Division of Reclamation stated that "Rocks need to be picked. Minor erosion, wet spots and ruts need to be eliminated" (ODNR, Division of Reclamation Files). Erosion and wet spots are still evident on Figure 26 and Figure 28 in June 1985. For a comparison of before and after reclamation; C-1061, see Plate 1 and Figures 23, 24, 25 and 26; and C-1501 see Plate 2 and Figures 27 and 28. Reclamation should be approved on Buckeye C-1061 and C-1501 at the end of the 1986 growing season returning the affected area to range land.

C & W (C-1109)

The C & W Mining Company mined coal from June 1979 to June 1982 under Permit C-1109. C-1109 permitted 158.7 acres of which 138.1 acres were affected (ODNR, Division of Reclamation Files). C-1109 is located in north central Section 13, Madison Township, Columbiana County, Ohio (Fig. 2½). C-1109 was mined under the same 1975 stripmine legislation, Chapter 1513 of the Ohio Revised Code, as the Buckeye C-1061 and C-1501. The C & W C-1109 site differs from the Buckeye sites in that the C & W Mining Company was frequently in violation of Chapter 1513 and delinquent in reclaiming land affected by mining.

Performance bond ranged from $2500.00 to $4000.00 an acre on the C-1109 site. The C & W Mining Company was sited for nineteen violations of Chapter 1513 of the Ohio Revised Code from September 1979 to October 1983. These violations include exceeding the limits of the permit, diminution of water supply, discharge of acid water, mining within a watershed and failure to construct a sediment pond, failure to control discharge, failure to maintain accurate blasting records and delinquent reclamation (ODNR, Division of Reclamation Files). All violations except delinquent reclamation violations

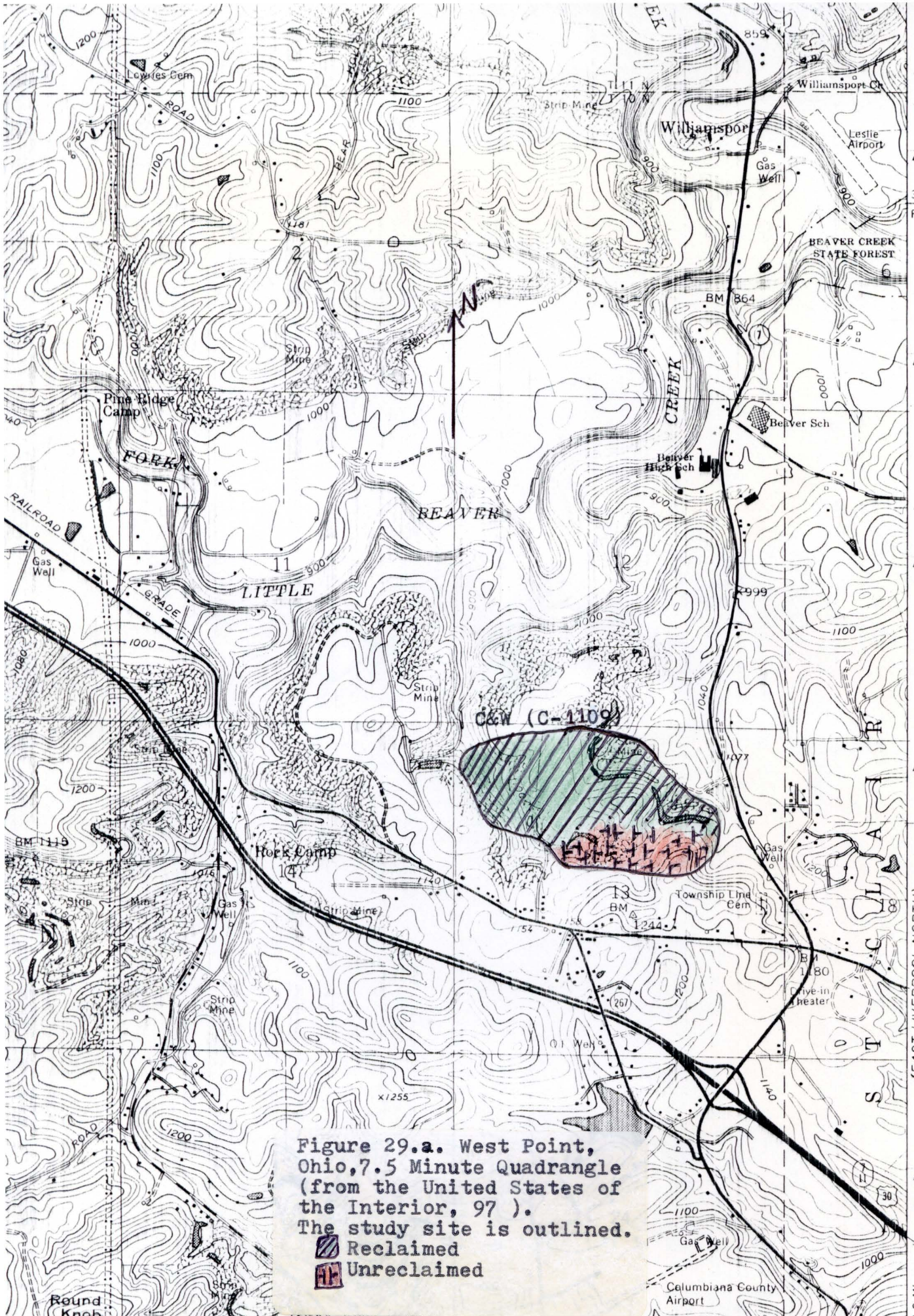


Figure 29.a. West Point, Ohio,7.5 Minute Quadrangle (from the United States of the Interior, 97). The study site is outlined.
Reclaimed
Unreclaimed

were eventually complied with by C & W. Failure to reclaim 106.2 acres by C & W Mining Company on the C-1109 site resulted in a bond forfeiture order in December 1984 (O.D.N.R., Division of Reclamation Files). As of June 1985, there had been no further reclamation on site C-1109.

Figures 29 through 44 depict the present condition of the C & W C-1109 site. Figures 29, 30, 31 and 32 are pictures of highwall, spoil and pit. The spoil and pit occupy approximately 40 acres. The highwall is in the southern-most portion of C-1109 and extends 2800 feet and ranges in height from 15 feet to 110 feet. Figures 33 and 34 show the impoundment of water directly below highwall. Tires are from Hoppel Trucking Company located south of highwall. Figure 35 shows sulfates running from auger hole contaminating the impounded water (Fig. 36). Figure 37, looking from highwall east towards Route 7, show change in contour of graded area. Area in Figures 37, 38, and 39 is not reclaimed sufficiently and is land which the bond has been forfeited on. Figures 40 and 41 are taken from the southern unreclaimed section of C-1109 and depict a portion of the approved reclaimed land. Figures 42 and 43 are pictures of approved reclaimed land located west of the highwall and north of route 30. Vegetation on reclaimed portion of C-1109 consists of fescue, orchard grass, alfalfa and red clover.

As of June 1985, the area has not been reclaimed to it's original contour and the remaining spoil will not fill the pit. The C-1109 has a potentially dangerous highwall which will most likely have to be shot off to fill the pit and remove the danger. In this case, fines and the most important deterring factor (possibility of not receiving future permits because of bond forfeiture) were not sufficient enough to make the C & W Mining Company reclaim C-1109 suitably.

Figure 29b. Highwall south C-1109.

Figure 30. Highwall and spoil south C-1109.

Figure 31. Spoil bank C-1109.

Figure 32. Final cut C-1109.

Figure 33. Impoundment of water below highwall C-1109.

Figure 34. Tires in final cut C-1109.

Figure 35. Sulfates running from auger hole.

Figure 36. Sulfates in impounded water.

Figure 37. Evidence in change of contour of graded area, east C-1109.

Figure 38. Unsuitably reclaimed area with spoil material exposed at graded surface.

Figure 39. Unreclaimed spoil.

Figure 40. North reclaimed portion of C-1109.

Figure 41. From southern unreclaimed portion of C-1109 looking north at reclaimed portion.

Figure 42. Reclaimed area west of highwall.

Figure 43. Reclaimed area north of Route 30.

C & W (C-1453)

Strip mine Permit C-1453, mined by C & W Mining Company, extends from the northwest corner of Section 31, Elkrun Township to the northeast corner of Section 6, Madison Township, Columbiana County, Ohio (Fig. 44). 245 acres were permitted under C-1453 from June 1981 to June 1984 (O.D.N.R., Division of Reclamation Files). The operator of C-1453, C & W Mining Company, frequently and repeatedly violated strip mine and reclamation law, Chapter 1513 of the Ohio Revised Code. These violations included the many violations already cited for C-1109 (also mined by C & W Mining Company) and other more blatant violations which showed C & W's total disregard for the land, environment, landowners in the vicinity and any recourse the State of Ohio might engage in pertaining to these violations. These more blatant violations included changing the contour of the land and altering the existing drainage pattern. The result of these violations is a drastic change in the drainage system; specifically surface runoff and Patterson Creek.

At present, mining has ceased at C-1453, the permit has expired and the application for a continuing D-Permit has not been approved by the Division of Reclamation. Also, C & W Mining Company has applied for reorganization under the bankruptcy statute. Because of C & W's filing for bankruptcy, the State of Ohio has no leverage or power over C & W to comply with existing violations and delinquent reclamation.

Plate 5 is an aerial photo of C-1453 in June 1982 during active mining. Figures 45 through 51 depict current conditions of site C-1453. Figure 45 shows Miller house with spoil in foreground (north) and highwall and spoil in background (southwest of house). Figure 46 is a picture looking north at the Miller house surrounded by spoil.

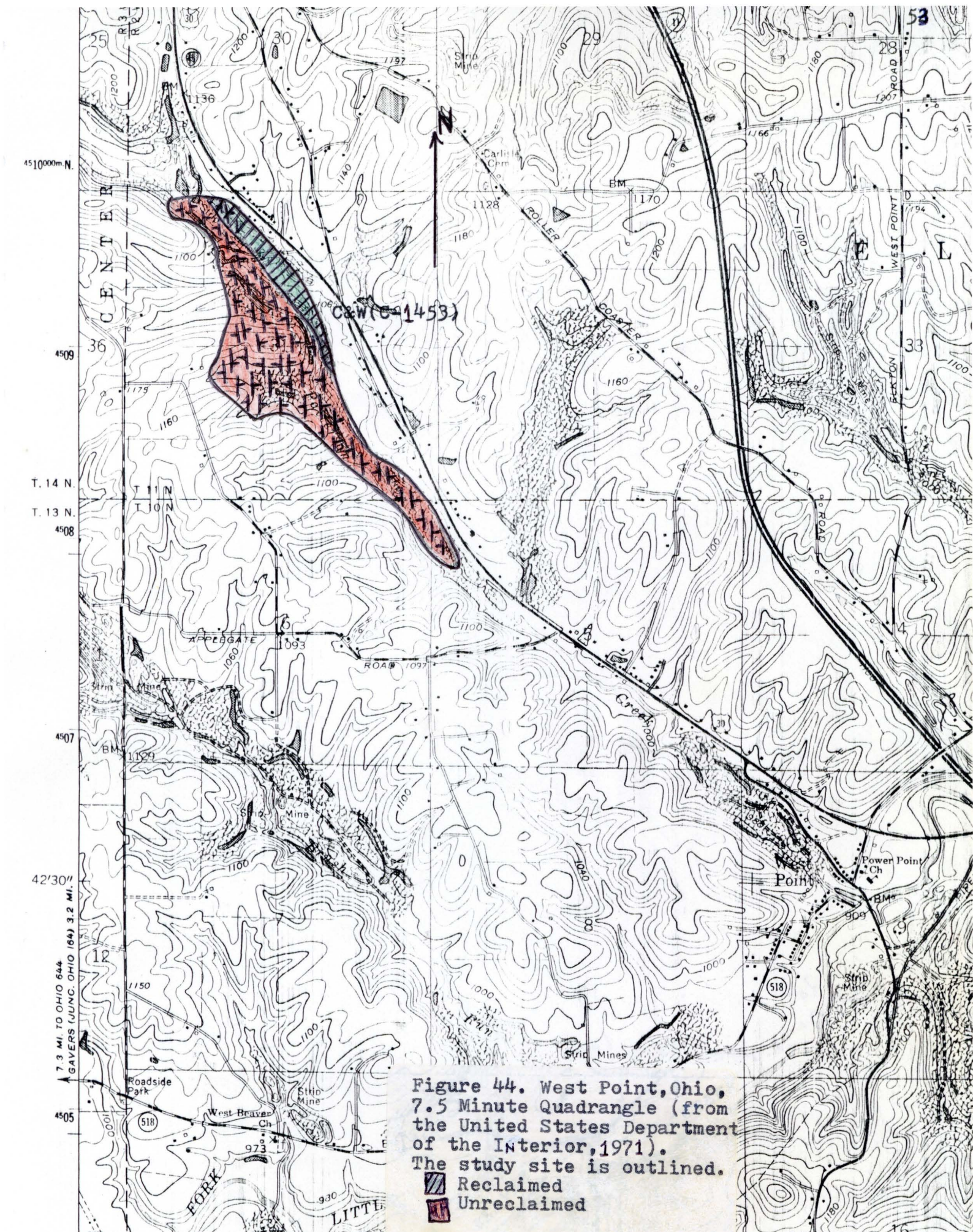


Figure 44. West Point, Ohio, 7.5 Minute Quadrangle (from the United States Department of the Interior, 1971). The study site is outlined.

Reclaimed

Unreclaimed

Plate 5. C&W (C-1453)
(ODNR, Remote Sensing, 982).

Arrows designate study site.
Miller house is circled.

Figure 45. Looking south at Miller house with spoil and highwall in background.

Figure 46. Looking north at Miller house surrounded by spoil.

Figures 47 and 48 are pictures of existing highwall which extends approximately 8500 feet and ranges from 40 to 140 feet in height. Figure 49 depicts a drainage ditch above highwall on western section of C-1453. Figure 50 is a view southeast of Miller house and no cost reclamation section. A no cost reclamation area is a previous abandoned mine area which the strip mine operator may use to dump spoil or store equipment as long as he reclaims it after use. The no cost section of C-1453 comes under The Abandon Mined Lands, Division of Reclamation. The no cost land reclamation project on C-1453 is a cheap way for the state to have the land reclaimed and at the same time, a cheap way to dispose of spoil by the operator, In the case of C-1453 no cost project, the contour of the land was raised and an insufficient amount of topsoil was placed above spoil material (Fig. 50 and 51). The higher contour of the no cost project has resulted in surface water to runoff to the Miller house and other nearby residents, whose dwellings are now lower than the surrounding affected land. At present, it seems that the unreclaimed C & W C-1453 site will remain in the condition it is now until C & W Mining Company litigates it's reorganization. It is also the author's understanding that the state will make allowances to C & W to get them to reoccupy the C-1453 site. The reason for the state's allowances are because if left to the State of Ohio to reclaim C-1453, it would cost millions.

Figure 47. 140 foot high highwall.

Figure 48. Highwall with dragline.

Figure 49. Drainage ditch above highwall west C-1453.

Figure 50. No cost area southeast of Miller house.

Figure 51. Looking south from backyard of Miller house at at higher contour of no cost area.

Ferris D-40

D-40 is the only study site being actively mined. The Ferris Coal Company is actively strip mining under Permit D-40; starting date was November 1982 and expiration date is October 1987. D-40 encompasses 247 acres and is located in Section 14, 15, 22 and 23 of Elkrun Township, Columbiana County, Ohio. The Ferris Coal Company is mining coal from the Upper Freeport (No. 7) and Middle Kittanning (No. 6) coals. See Figure 52 for location of site D-40.

Ferris is mining under the recent 1981 D-Permit legislation, Chapter 1514 of the Ohio Revised Code. Chapter 1514 is the most stringent of all strip mine laws enacted to this date. Reclamation requirements are generally the same as the 1972 and 1975 legislation. The major differences are Chapter 1514 of the Ohio Revised COde provides that: 1) the permit is for five years, instead of three years, 2) an Interstate Mining Compact was enacted and 3) bond was set at $2500.00 per acre and a person convicted of three offenses violating Chapter 1514 will be issued no permit to mine for a period of five years. Section 1514.30 of the Ohio Revised Code, Interstate Mining Compact, provided a way to keep violating and bond forfeiting strip mine operators from skipping back and forth to bordering states to mine. Strip mine operators frequently moved from state to state because their violations made it impossible to receive another permit in the state where the violations occurred.

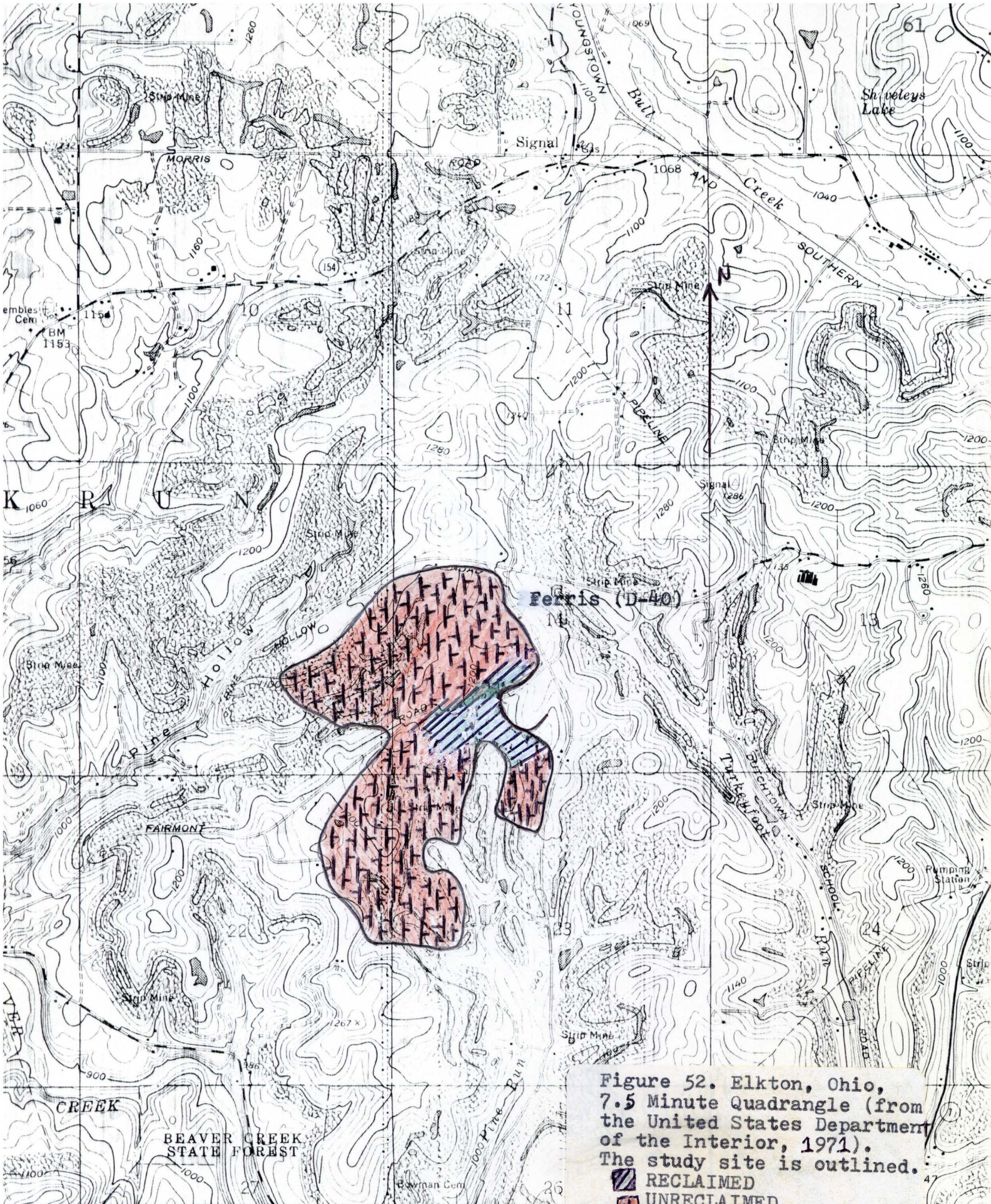


Figure 52. Elkton, Ohio, 7.5 Minute Quadrangle (from the United States Department of the Interior, 1971). The study site is outlined.
RECLAIMED
UNRECLAIMED

Plate 6 shows D-40 site during active mining of June 1983. Figures 53 through 58 are photos depicting the present condition of the Ferris D-40 site. Figure 53 shows highwall and drag line in pit. The highwall is located in the northwest portion of D-40 (Fig. 52) and extends for approximately 5000 feet and reaches a height of 140 feet. Figure 54 depicts a sag pond in the northwest corner of site D-40. Figure 55 shows mounds of top soil stored for later reclamation. Figures 56 and 57 show active mining to the northwest of site D-40 and recently reclaimed area to the northeast (Fig. 58). The following figures show that the Ferris Coal Company is complying with reclamation requirements while actively mining.

Plate 6. Ferris (D-40)
(ODNR, Remote Sensing, 983).
Arrows designate study site

Figure 53. Highwall and dragline in pit.

Figure 54. Sag pond in northwest corner of D-40.

Figure 55. Stores piles of top soil.

Figure 56. Northwest D-40 being actively mined, northeast, recently reclaimed.

Figure 57. Left (northwest) actively mined, right (northeast) recently reclaimed.

Figure 58. Recently reclaimed portion of D-40 (northeast).

CONCLUSIONS

Strip mine legislation prior to 1972 was ineffective as a tool to force strip mine operators to reclaim mined lands. Many strip mine operators in Columbiana County, Ohio, mining under amendments of Chapter 1513 of the Ohio Revised Code enacted before 1972 found it more profitable to abandon the land unreclaimed and forfeit their performance bond. The Island Run site (4335, 4576, 4773) mined by the Island Run Coal Company from November 1962 to November 1965 and the Kelly A-663 site, mined by the Kelly Mining Company, October 1969 to October 1970, were the respective operators opting to abandon the mined land instead of reclaiming it. The pre-1972 strip mine legislation, when observed by operators, was inadequate in reclaiming the mined land to a productive state because of it's insufficient generalized reclamation requirements.

The Buckeye C-1061 and C-1501 sites mined by the Buckeye Coal Company are examples of mined land reclaimed to range land under the more stringent 1975 Strip mine law. C-1109 and C-1453 mined by C & W Mining COmpany under the 1975 Strip mine law are examples of an operator disregarding and repeatedly failing to comply with the strip mining and reclamation requirements. At site C-1109, performance bond has been forfeited for failure to reclaim land affected by mining. Site C-1453 is a special case, in that at present, the state will not attempt to reclaim the site because of the great cost involved. Site C-1453 will remain in it's present condition until the C & W Mining Company resolves it's bankruptcy problem. If C & W's reorganization under bankruptcy is acceptable to the Division of Reclamation, C & W will most likely be issued a new D-Permit for the site. Reorganization under the C-Permit legislation was a frequent device used by strip mine operators who did not wish to comply with reclamation requirements. Reorganizing under a different name or with different officers allowed the violating operators to avoid prosecution and to receive future strip mining permits.

Ferris D-40 being actively mined by the Ferris Coal COmpany, is an example of land reclamation under the present 1981 Chapter 1514 of the Ohio Revised Code. Ferris D-40, Buckeye C-1061 and C-1501 and the Kelly A-663 exemplify the impact of efforts by the state of Ohio to reclaim strip mined lands to a productive state by 1) more stringent reclamation requirements, 2) more severe punishment for violators and 3) more funds and projects to reclaim abandoned mined lands.

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